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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/822,825	04/13/2004	Katsuya Fukase	300.1155	4802

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EXAMINER

BARRECA, NICOLE M

ART UNIT	PAPER NUMBER
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1756

DATE MAILED: 03/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/822,825

Applicant(s)

FUKASE ET AL.

Examiner

Nicole M Barreca

Art Unit

1756

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) .
Paper No(s)/Mail Date. ____ . |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>7/7/04</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

1. Claims 1-22 are pending in this application.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 4-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 4, 9 and 13 recite etching selectively only the second metal layer through the openings of the patterned second metal layer. It is unclear how the layer can be etched through openings in itself.

Claim 4 and 9 recite etching again "the metal layer" by means of a second masking. It is unclear which metal layer, the first or second, is etched again.

Claim 13, line 13 recites "the first resists". Is there more than one layer present in the first resist?

Double Patenting

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Art Unit: 1756

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

5. Claims 1-22 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-27 of copending Application No. 10/978,521. Although the conflicting claims are not identical, they are not patentably distinct from each other because both claim half-etching a metal layer using a first mask, applying, exposing and developing a liquid positive resist to form a second mask and etching again the metal layer using the second mask. The only difference between the claims of the present application and the claims of 10/978,521 is that the claims of 10/978,521 recite repeating the steps of the resist application, the resist exposure, the resist development and the half-etching. It would have been obvious to one of ordinary skill in the art that such process steps could be repeated if the final device being manufactured required multiple patterns.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

Art Unit: 1756

only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Appelt (US 6,222,136).

8. Appelt teaches a method for forming a flexible printed circuit board (col.3, 37-58).

Metal layer 12 is applied to at least one opposing face 18 of dielectric substrate 14.

First photoresist 22 is applied, exposed and developed to form a first pattern of photoresist section. The exposed portions of the metal layer are then partially etched.

Second positive (electrodeposited) photoresist 24 is exposed through a mask (light-block) and developed to provide a pattern of remaining second photoresist sections covering intended conductive bumps and intended copper circuitry. As can be seen in Figure 1(d) that the exposure mask left a part of the second photoresist located under the pattern of the first masking unexposed. The exposed portions of the metal layer are then etched and the resists removed. See col.4, 62-col.6, 25 and Figures 1(a)-1(e).

9. Claims 11 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Hamada (US 6,130,027).

10. Lead frame substrate 1 (metal plate) is covered on both sides with photosensitive film 2, which is exposed to light through a patterned mask and developed. The lead frame is then partially etched. Etched surface 3 is coated with positive resist which forms photosensitive coating film 4 upon drying. Photosensitive coating 4 is exposed to light using photosensitive film 2 as a mask, and developed to form patterned venting

Art Unit: 1756

film 5. Etching is then performed, followed by resist removal. See col.2, 14-37 and Figures 1(a)-(g).

11. Claims 11, 12, 17-22 are rejected under 35 U.S.C. 102(e) as being anticipated by Lokhorst (US 6,635,407).

12. Electrically conductive base metal 11 is coated with photoresist 13 on both sides. The photoresist 13 is exposed and developed to form a pattern. The metal is then partially etched to form cavity 15. Base metal 11 is then coated with liquid, positive photoresist 17. The second photoresist 17 is exposed to parallel light through a photomask (light-block) protecting portions of the resist which were located under the first mask. See Figure 2D. After development to form a pattern the metal is etched again, followed by resist stripping. See col.3, 7-35 and Figures 2A-2F.

13. Claims 11, 13, 15-18, 20, 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Kenji (JP 05-121482, English translation from JPO).

14. Lead frame 4 includes first metal layer 1 (20 microns), second metal layer 2 (125 microns, metal plate) and third metal layer 3 (20 microns). Resist film 5 is applied to the lead frame and patterned. The lead frame is then (half) etched using resist film 5 as a mask. Resist film 6 is electrodeposited, exposed and developed. First metal layer 1 is then etched using mask resist film 6a, formed by the second and third metal layers 2 and 3. The figures illustrate that the resist films are removed. See [0010]-[0016] and Drawing 1.

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. Claims 4, 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Appelt in view of Co (US 6,357,023).

17. Appelt does not disclose forming a second metal layer on the first metal layer. Co teaches that a typical printed circuit board usually contains multiple metal layers for wiring (col.6, 9-11). It would have been obvious to one of ordinary skill in the art to form a second metal layer on the first metal layer in the method of Appelt because Co teaches that typical printed circuit boards contain multiple metal layers.

18. Claims 2 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Appelt as applied to claims 1 or 18 above, and further in view of Gearhart (US 5,858,622).

19. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Appelt in view of Co as applied to claim 4 above, and further in view of Gearhart (US 5,858,622).

20. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hamada as applied to claim 11 above, and further in view of Gearhart.

21. Claims 12, 14, 19, 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kenji as applied to claims 11, 13, 18 or 20 above, and further in view of Gearhart.

22. The references are silent on the exposure light used to pattern the photoresist and do not disclose using parallel light. Gearhart teaches that exposing a photoresist to parallel light is essential for forming an accurate reproduction of the mask pattern (col.2, 17-23). It would have been obvious to one of ordinary skill in the art to expose the photoresist with parallel light because Gearhart teaches that this is essential for forming an accurate reproduction of the mask pattern.

23. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Appelt as applied to claim 1 above, and further in view of Ishio (US 6,583,843).

24. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Appelt in view of Co as applied to claim 4 above, and further in view of Ishio (US 6,583,843).

25. Appelt teaches forming a flexible printed circuit board but does not explicitly recite that a tape automated bonding (TAB) circuit board is made. Ishio teaches that flexible circuit boards are generally mounded using TAB (col.3, 9-20). It would have been obvious to one of ordinary skill in the art that the flexible circuit board in the method of Appelt was used to form a TAB circuit board because Ishio teaches that flexible circuit boards are generally mounded using TAB.

Conclusion

26. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nicole M Barreca whose telephone number is 571-272-1379. The examiner can normally be reached on Monday-Thursday (9AM-7PM).

Art Unit: 1756

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Nicole M Barreca
Examiner
Art Unit 1756

3/17/05

A handwritten signature in black ink, appearing to read "Nicole Barreca", is written over the printed name and title.